



Submission Services Setup and Testing Guide

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TRF-CDA

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1 Document Information

1.1. Contributors

Please provide details of all contributors to this document.

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1.2. Version Control

Please document all changes made to this document since initial distribution.

| Date | Version | Author | Section | Amendment |
|----------|---------|------------------|---------|--|
| 11/01/17 | 0.1 | M. McCalister | All | Initial draft. |
| 11/4/17 | 1.0 | M. McCalister | All | Initial draft |
| 11/8/17 | 16.5 | L. Cox | All | Updated version to current release, minor edits to formatting and content. |

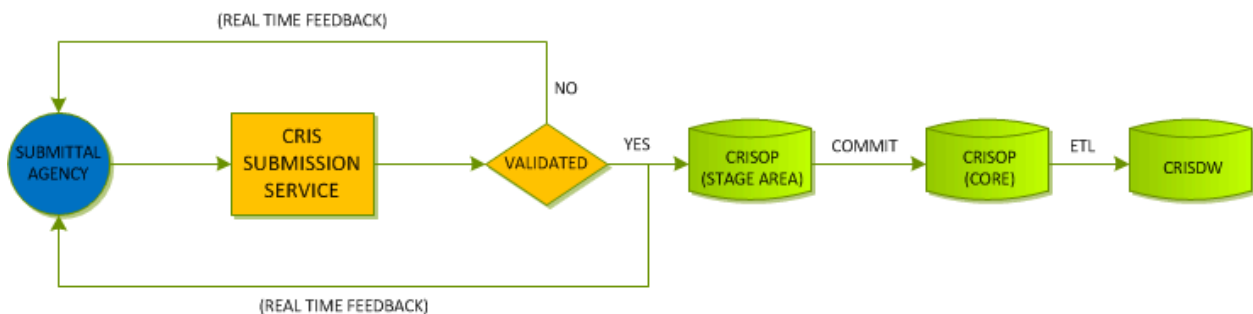
2 Overview

This document outlines the background and steps required by TxDOT, an agency, or an agency and their vendor, to electronically submit crash records in production using Submission Services. Submission Services is the name of a data channel based on web services that allows law enforcement agencies to transmit crash records to the TxDOT Crash Records Information System (CRIS) for processing, storage and reporting. If an agency selects the Submission Services option for data transmission, the agency is required to develop SOAP based web service client to communicate with CRIS.

TxDOT developed the Submission Services as an option for crash data transmission so as to allow agencies to continue to use a new or existing internal application commonly referred to as records management systems (RMS). There are over 35 agencies submitting crash records to TxDOT using the submission services data channel. These agencies represent approximately 29% of the crash volume in the state.

High Level Crash Flow

The following diagram illustrates the architectural flow of crashes submitted through the CRIS Crash Submission Service.



The CRIS Submission Service allows authorized law enforcement agencies to submit crash reports into CRIS programmatically via a secure web service. A submittal agency can make two types submission requests to the CRIS Submission Service:

1. Validation Request – crash reports are submitted for validation only, e.g., rules validation, xml validation, etc., but do not formally submit to CRIS for downstream processing)
2. Submission Request – crash reports are submitted for validation and processing, i.e. rules validation, xml validation, etc., and formally submit to CRIS for downstream processing if validation is successful

A specific submission request can contain one or more crash reports. The submitted crash reports are processed in real time and the validation results (i.e., whether or not the submitted crashes are validated successfully, and any error messages in case of validation failures) are returned in the submission response object corresponding to the submission request. For validation request, the submitted crash reports will not be committed to CRIS after a successful validation. For submission request, the submitted crash reports will be committed to CRIS after a successful validation.

Terms

AAM – Agency Authorization Manager

CMV – Commercial Motor Vehicle

CR-3 – Peace Officer's Crash Report

CRASH – The CRASH Application

CRIS – Crash Records Information System

ETL – Extract, Transform, and Load

FR – Functional Requirement

GVWR – Gross Vehicle Weight Rating

ORM - Object-Relational Mapping

RGVW – Registered Vehicle Weight Rating

XSD - XML Schema Definition

NUM. – Abbreviation for NUMBER for consistency with the CR-3 form

3 TxDOT Certification Setup

The following are the steps required for TxDOT to setup the templates and turn on certification mode to support the certification process.

Enable Certification Mode

- a. Login to CRIS
- b. Navigate to Tools => <https://crisuat.dot.state.tx.us/secure/Tools>
- c. At the Tools landing page select ***E-Submission Certification Manager***.
- d. Select ***Manage Settings***.
- e. Check ***Enable Agency Certification Mode***.
- f. Select ***Save Settings***.
- g. Select ***Return to E-submission Certification Manager***
- h. Once the Agency Certification (NEW or RECERT) is saved a system notification will be sent to the email address(es) listed in the notification field with the following information:

Deploy Crash Templates

- i. Login to CRIS
- j. Navigate to Tools => <https://crisuat.dot.state.tx.us/secure/Tools>
- k. At the Tools landing page select ***E-Submission Certification Manager***.
- l. Select ***Manage Templates***.
- m. Select ***+ Add***.
- n. Enter ***Name*** – A significant name
- o. Enter ***Description*** – A significant description
- p. Enter ***Crash Id*** – this corresponds to a crash id in UAT that will serve as the template for agencies to match
- q. Select ***Certification Type*** (*NEW CERTIFICATION* or *AGENCY RECERTIFICATION*).
- r. Select ***Template Is Active***

4 Agency Certification Setup

The following are the steps required to onboard any law enforcement agency that is interested in transmitting crash data using Submission Services.

2. Agency requests setup to TxDOT – esubmission@txdot.gov
3. The TxDOT AAM will setup the required configuration in the User Acceptance Testing (UAT) environment. The agency will be setup in Configure as follows:
 - a. Login to CRIS
 - b. Navigate to Tools => <https://crisuat.dot.state.tx.us/secure/Configure>
 - c. At the Configure landing page select **Agencies**.
 - d. Select the agency from the list that has requested to begin the certification process and select
 - e. Select the **E-Submission** tab from the **Edit Agency** panel.
 - f. Select the checkbox for **E-Submission Enabled for this Agency**.
 - g. Select the checkboxes for the CR3 form versions that apply to the agency e.g. **CR3-2010 Certified**, **CR3-2015 Certified** and **CR3-2018 Certified**.
 - h. Select **Save Agency Settings**.
4. The TxDOT test team will setup the required configuration in the User Acceptance Testing (UAT) environment. The agency will be setup in Tools as follows:
 - a. Login to CRIS
 - b. Navigate to Tools => <https://crisuat.dot.state.tx.us/secure/Tools>
 - c. At the Tools landing page select **E-Submission Certification Manager**.
 - d. Select **Agency Certifications**.
 - e. Select **+ Add**.
 - f. Select the agency from the drop down that has requested to begin the certification process and select **Continue**.
 - g. Enter the notification email addresses for interested parties at the agency or the agency vendor that will be involved in the configuration and testing. Generally, the key resource to notify is the software development lead on this effort.
 - h. Enter a strong **Password**.
 - i. Enter a strong **Encryption Key**.
 - j. Select **NEW AGENCY CERTIFICATION** or **AGENCY RECERTIFICATION**. Agencies that are submitting crashes through Submission Services for the first time will be classified as **NEW AGENCY CERTIFICATION**. Agencies that are currently submitting crashes through Submission Services but are adopting changes to crash data based on an update to the CR3 form will be classified as **AGENCY RECERTIFICATION**
 - k. Select **Save Agency Certification**.
 - l. Once the Agency Certification (NEW or RECERT) is saved a system notification will be sent to the email address(es) listed in the notification field with the following information:

Your Agency Certification assets are available for download. Click on the link below to download the file.

[Agency XML Submission Certification Assets](#)

If you have any questions or need assistance, please contact TxDOT at esubmission@txdot.gov.

- m. The link in the email body allows the user to download artifacts in a download zip file that will be used by the agency to start the development of a web services based or update the existing web services interface to submit crash data. Included in the zip are the following:
- This document
 - BusinessRules.xml – The business rules for submitting a crash to TxDOT
 - CodeTables.xml - Code Tables or Domain Data tables in xml document format
 - CR3-2018.xsd - XML Schema Definition (XSD) for a crash in xml document format
 - SampleCrash.xml – a sample crash in xml document format
 - Certification test crashes – PDF image of the test crash reports for which TxDOT expects to receive the data transmission from the agency to receive certification. **Note:** The file names of the images contain the crash id that must be used in the AgencyCrashIdentifier field in the xml for each crash

5 Agency Processing

Crash Data

Each crash is represented and transmitted to TxDOT as a document in XML format that adheres to an established xml schema definition (XSD). One XML document represents one crash. The XSD for a crash is included in the download zip. A version of CRIS XML Schema, namely, `crisV$Agency.xsd`, is designed to support submission service. Where \$ represents a specific version number 7, 8, 9 etc.

Agency Crash Identifier

Each crash submitted through the Submission Service web services interface must populate the *AgencyCrashIdentifier* field in the crash report xml, and this identifier must be unique for the submittal agency. This identifier will be stored in CRIS and will be used for all communications with the agency, as well as in the duplicate/supplement detection logic during submission processing. Below is a snippet from the xml schema definition for the xml element that is designated to capture this identifier.

```
<xsd:element name="AgencyCrashIdentifier" >
<xsd:annotation>
<xsd:documentation>Agency crash identifier unques identify the crash
within the agency</xsd:documentation>
</xsd:annotation>
<xsd:simpleType>
<xsd:restriction base="xsd:string">
<xsd:minLength value="1"/>
<xsd:maxLength value="254"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
```

Crash Supplement Process

The agency is required to use the same original unique identifier for a crash supplement that was used on the original. For example, if the original unique identifier was 1000234, then the supplement unique identifier must be 1000234 and the “AmendmentFlag” must be set to “Yes”. This allows the system to match the records and process the record as a supplement, not an original.

Crash Delete Process

If a record that has been successfully sent to TxDOT through Submission Services to the production environment is deleted from the agency RMS the same must occur in CRIS. At this time, the delete of any record submitted by any agency is a manual process that requires coordination with the TxDOT support team directly.

Crash Location

If the agency's internal application allows for pre-population of address from another source, the agency can use the StreetName field to populate the block number, street prefix, street name and street suffix. The StreetName is 60 characters. Crash location must be completed per the XSD.

Crash Investigator Narrative

The agency must submit the crash narrative as part of the XML and must include only valid UTF8 characters.

Crash Investigator Diagram

The agency must submit a single, electronic diagram embedded as a string in the XML using Base64 encoding. Submission Services accepts the following mime types: TIF, GIF, BMP and PNG. The diagram cannot be sent as a separate page in the crash report. The diagram must be submitted in black and white. TxDOT generates the crash report image based solely on the content of the XML, which represents the crash, including the narrative and diagram elements provided in the XML.

Agency Case ID

Agency case ID is a value created by the agency for the case ID field in the crash report.

```
<xsd:element name="CaseID" minOccurs="0">
<xsd:simpleType>
<xsd:restriction base="xsd:string">
<xsd:maxLength value="20"/>
</xsd:restriction>
</xsd:simpleType>
</xsd:element>
```

Code Tables or Domain Data

It is mandatory that the agency use the TxDOT code tables and their associated values. The TxDOT code tables include only valid values and prevent a record from failing XML validation. The agency will receive the codes tables in an xml document contained in the zip download. Each XML document requires IDs versus codes, however, codes are typically provided on the image.

6 Agency Testing

All agencies that elect to use the submission services channel to submit crashes electronically to TxDOT will be required to pass through a certification process. The certification process is a baseline testing process designed to ensure that the data sent to TxDOT by the agency is valid and accurate according to the CR100 – Instructions to Police. Agencies that are already submitting records to TxDOT using the submission services channel will be required to be re-certified each time there is a change to the CR3 form.

The certification process requires that each agency submit crash data to the TxDOT Test environment that accurately reflects the information provided in sample crash report images included in the zip file download. The data for each crash i.e. scenario that is part of the certification must match for every field in the image. If the data does not match the calling web service will be provided with all the detail required to correct any errors found. Once the data submitted for each crash contained in the zip file matches the agency will be certified.

If an agency is using a vendor application i.e. records management system (RMS) or similar software to capture crash data, TxDOT strongly encourages both the agency and vendor representatives to participate in regular conference calls. The vendor should also be required to sign off that the client agency is ready to process records in production.

Functional and Technical Agency and Vendor Contacts

To allow TxDOT to communicate any updates and provide ongoing support each agency should provide the following contacts, including the title and name, phone number and email for each contact. Please email the contact information to esubmission@txdot.gov.

- a. Agency Functional Contact
- b. Vendor Functional Contact
- c. Agency Technical Contact
- d. Vendor Technical Contact

Lifecycle Environments

In order to support the setup and testing and go live of agencies that wish to use Submission Services to send crash data, TxDOT maintains the following environments:

- Development
- Test (User Acceptance Test)
- Production

TxDOT recommends an agency maintain the same number of lifecycle environments, but, at a minimum, must maintain separate test and production environments. Each agency will be required to test before the agency before submitting “real or live” crash records to the

TxDOT production environment. TxDOT will guide each agency through the testing process. TxDOT also requires an agency or an agency's vendor to supply IP addresses for any test or production location the records will be sourced from. These specific IP addresses will be whitelisted on an environment by environment basis.

Test Preparation

Testing preparation is required by the agency and their vendor. TxDOT will support testing, once the agency's internal application has been tested and the agency's submitted XML matches the certification crash reports provided in the zip download. Please note the following TxDOT recommendations for each agency:

- Confirm the agency vendor has incorporated the business rules into agency internal application.
- Confirm the agency vendor is using the TxDOT code tables for any values, in the agency internal application, that offer a drop down list of values.
- Review and compare the agency XML to the agency image to ensure the same information is presented on both. If TxDOT receives an agency XML that does not match the certification crash report errors will be returned by the web service and the certification for the crash will be not be approved.

Authentication and Encryption

Each agency and their vendor, if applicable, will be given the following information for test and production, which will allow the agency and the vendor to begin testing:

1. Agency ID
2. Agency Globally Unique Identifier (GUID)
3. Password
4. Zip Encryption Key

This information is sent via email after the Submission Services kick off meeting. The Agency ID, GUID and password serve to authenticate that the agency transmission is valid for the agency. The encryption key ensures that the payload is accessible to external parties.

Access

TxDOT requires an agency or an agency's vendor to supply the source IP address for the data transmission for both test and production to esbumission@txdot.gov. TxDOT also requires the agency or the agency's vendor to inform TxDOT if there are any changes made to their IP address. Once the source IP address list is shared with TxDOT, the agency will be able to access the web service URL for transmission. The following URL's provide the web service definition language for the SOAP based web services for the test and production environments.

Test: <https://crisuat.dot.state.tx.us/secure/CrisServices/SubmissionServiceWS?wsdl>

Production: <https://cris.dot.state.tx.us/secure/CrisServices/SubmissionServiceWS?wsdl>

Test Submissions

Each crash submitted through the Submission Service web services interface must populate the *AgencyCrashIdentifier* field in the crash report xml document. This identifier will be used to match and compare each crash report submission to the template crashes by the crash id defined by TxDOT for certification or re-certification. **The crash identifier is part of the file name of the template crash images in the certification packet contained in the zip download.**

Test Progress

As testing progresses agencies will receive email notifications detailing the status of the certification. An example is included below:

From: TRF_CRISTechSupport@txdot.gov
Sent: Monday, November 6, 2017 7:11:20 PM (UTC+00:00) Monrovia, Reykjavik
To: Mark McCalister-C
Subject: (UAT) Agency Certification Progress Report

This is to notify you that the following template is now certified:

1. CERTIFICATION SCENARIO 3

Your agency has successfully completed 2 out of 6 templates. If you have any questions or need assistance, please contact TxDOT at the following email address esubmission@txdot.gov

Test Troubleshooting Tips

- If a login page is displayed when attempting to access either URL, this indicates access is not configured for the agency.
- Encryption sample

The padding is AES/ECB/PKCS5Padding. Here is sample Java code for the encryption.

```
...
...
public static final String UTF8 = "UTF-8";
public static final String AES = "AES";
public static final int IV_LEN = 16;
public static final String TRANSFORMATION_NO_IV = "AES/ECB/PKCS5Padding";
public static final String TRANSFORMATION_WITH_IV = "AES/CBC/PKCS5Padding";

public static String aesEncrypt(String key, String content) throws Exception {
    if (content == null) {
        return null;
    }
    Cipher cipher = Cipher.getInstance(TRANSFORMATION_NO_IV);
    byte[] skey = key.getBytes(UTF8);
    SecretKeySpec skeyspec = new SecretKeySpec(skey, AES);
```

```
        cipher.init(Cipher.ENCRYPT_MODE, keyspec);  
        final byte[] encrypted = cipher.doFinal(content.getBytes());  
        return new String(Base64.encodeBase64(encrypted), UTF8);  
    }  
    ...
```